

## LABORATORY REPORT

Attn: Benjamin Doyle  
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Report No.: B24110149  
Date Reported: 11/22/2024  
P.O. No.: Verbal-Ben Doyle

## Expert Report

### Rebuttal Arguments Concerning Case No. 324-CV-00410-B

Prepared in Accordance with Federal Civil Procedure 26

Submitted By: Jeffrey Michael Molnar  
Submission Date: November 22<sup>nd</sup>, 2024

**Expertise:** Electron Microscopy/Metallurgy/Materials Science/Forensic Investigation of Industrial Failures Due to Corrosion.

CLEBURNE TRAINING AND FITNESS CENTER



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## 1.0. Expert's Background/Education.

### 1.0.1. Contact Information:

Jeffrey Michael Molnar  
3100 N. Hemlock Circle  
Broken Arrow, Oklahoma 74012  
Mobile: 918.886.5141

### 1.0.2. Education and Work Experience:

**Education:** B. Sc. - Metallurgical and Materials Engineering, Michigan Technological University (95').

**Employment:** Senior Engineer/Forensic Analyst (01/13' to Current), **Element Materials Technology.**

- Perform a wide range of forensic investigations specific to the Aviation industry; including landing gear assembly failures and jet engine overhaul equipment.
- Perform forensic investigations and materials analysis for a wide range of Defense industry article failure events; particularly those falling under the International Traffic in Arms Regulations (ITAR).
- Perform failure investigations of upstream and downstream pipeline, fracking equipment, and oil industry equipment; particularly regarding events that have resulted in a release.
- Routinely perform corrosion driven forensic protocols throughout the energy production and energy exploration sectors.
- Characterization of advanced polymers and polymer-ceramic composites.
- Perform electron microscopy and surface characterization work for medical devices; in particular, specialty alloy implants for human structural/skeletal support.
- Perform on-site metallurgical examinations at oil refineries where catastrophic events have occurred with established asset loss that was often on the order of millions of dollars.



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- Provide expert witness metallurgical/materials testing and provide expert reports for litigation cases.
- Interface directly with engineering managers, directors, executives, and business owners to identify, develop, and solidify engineering test protocols that drive business growth.
- Characterization of ultrathin films (Atomic Force Microscopy, Optical Ellipsometry, Low Landing Energy Electron Microscopy, etc.).
- Handle nearly all business and accounting aspects of each and every project from initial quoting to a formally signed final report. Additionally provide support to client engineering teams through on-site or remote presentation of my work/report(s).
- Manage routine maintenance, drive optimum performance, ensure complete repair, and oversee the general day to day operations of the electron microscopy (EM) facility at Element Broken Arrow.
- Frequently host teams of engineers and scientists for multiple-day and live on-site advanced microscopy workflows; particularly in the catalyst market specific to the generation of bio-jet fuel.

**Failure Analyst/Materials Engineer** (2008 to 2012). **ITT Night Vision.**

- Responsible for materials characterization and failure analysis work in support of manufacturing, product development, and research divisions corporate wide.
- Manage small to large scale engineering projects requiring timely and accurate materials analysis, and provide recommendations to all levels of engineering management to support research projects or in-process/production engineers.
- Responsible for SEM, TEM, AFM, XRF, XRD, FTIR, OM, FIB, XPS, Spectral Ellipsometry, and Mechanical/Electrical Testing of Night Vision system components.
- Experience analyzing corrosion and mechanical failures of Titanium Alloys, Aluminum Alloys, Nickel Base Alloys, and composites .



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- Responsible for product quality testing (PQT).
- Publish in depth technical reports to senior process engineers and engineering management.
- Ultra-thin films characterization via advanced transmission electron microscopy (TEM).

**Senior Microscopist (2004 to 2008). Thermo Fisher Scientific (Lancaster Laboratories).**

- Responsible for the analysis and characterization of organic and inorganic end products, competitor products, and new products developed by the clients' operations.
- Perform SEM, ESEM, OM, Ultramicrotomy, and Confocal Microscopy to characterize metallics, polymers, composite materials, and naturally occurring materials such as wood, and plants.
- Interface with engineering staff to assess project goals and provide materials characterization work in support of product development and process changes.
- Developed a novel polymer/polymer fiber using a single stage process versus the industry wide and typical multi-stage processes (global publication).
- Generate detailed technical reports to senior management and staff engineers.

**Awards:** *ITT Exelis SILVER Ring Of Quality Award* – Identified, characterized, tested, and implemented a new material system to Night Vision Goggles; this achievement was documented at ~2.5M per year cost savings to the United States government and department of defense.

**Publications:** Mishra K., Yu H., Molnar J., Baliga V., "Design of a Polymer Blend For One-Step Porous Fiber Fabrication", *Designed Monomers and Polymers*, Volume 12, Number 3, pp. 273-278.

**Certifications:** VBLSS Green Belt.

**Activities:** Woodworking, Ice Hockey, Golf.



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### 1.0.3. *Experience Related to This Case.*

My experience in the field of electron microscopy (EM) spans over 25 years across academia and industry. I have been a dedicated operator (*i.e.* almost daily) of EM tools, specifically the scanning electron microscope (SEM) coupled with X-ray energy dispersive spectroscopy (EDS), for over 20 years in the industry. I have therefore come to specialize in the execution of SEM/EDS work to solve forensic cases across a wide range of business sectors, including the use of transmission electron microscopy (TEM). More specifically, I have conducted EM work leading to the solution of literally hundreds of industrial *component corrosion failure* event(s). My profession and career as a metallurgist, dedicated forensic analyst with expertise analyzing corrosion, and avid EM operator, are therefore specifically fundamental and applicable to the facts of this case.

### 1.0.4. *Fee Schedule.*

I have been employed to review the facts of Case No. 324-CV-00410-B and render my opinions with respect to the CHURCH MUTUAL - Cleburne Training & Fitness (00001263151) 001301 report written by Ron Dutton Consulting Services, LLC. My fee schedule for this casework is as follows:

## Jeffrey Michael Molnar, Fee Schedule (2024)

### 1.0.4.1. *Technical Work*

- Review of supporting case documents (*i.e.* depositions, e-mails, legal and technical reports, images, etc.)
- Technical and non-technical research.
- Evaluation of case report data and outside party conclusion(s).
- Generation of report(s) to client(s) and attorney(s).

Fee: \$350 per hour (USD350·hr<sup>-1</sup>).



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#### 1.0.4.2. *Litigation Work*

- Depositions. Deposition Preparation.
- Court Proceedings/Trial. Court Preparation.

Fee: \$500 per hour (USD500·hr<sup>-1</sup>).

#### 1.0.4.3. *Travel*

Fee: \$125.00 per hour (USD 125·hr<sup>-1</sup>).

### 2.0. **Basis of Opinions.**

My opinions are based on the analytical work originally performed in Element Materials Technology report number B24060512. More specifically, my opinions are based on discussion(s) set forth in the Dutton report CHURCH MUTUAL - Cleburne Training & Fitness (00001263151) 001301 document as it pertains to my original work in B24060512.

#### 2.0.2. ***Opinion Disclaimer.***

I reserve the right to change my opinions in this report based on additional information specific to this case that may be presented to me in the future. Possible modifications to any given original opinion narrative are therefore based *only* upon information (*e.g.* data sets, images, etc.) that was *not available* for consideration at the time this report was formally submitted.

#### 2.0.3. **List of Recent Cases.**

- Case number CIV-22-808-SLP.
- Case number D-905-CV-2024-00509.
- Case number CIV-23-902-PRW.
- Case number CIV-21-553-JD.
- Case number CIV-23-9-PRW.
- Case number 2020-024624-CA-01.
- Case number 5:23-CV-01362.
- Case number 423-8999.
- Case number CIV-22-863-JD.

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### 3.0. Statement of Opinions.

**3.0.1. OPINION #1:** In the BACKGROUND section of the CHURCH MUTUAL report, paragraph 3, Mr. Dutton clearly uses the *incorrect definition of functional damage*.

The CHURCH MUTUAL report paragraph 3 states: “Functional damage, on the other hand, is hail damage to roof coverings that results in damage that will allow the penetration of water through the roof covering or that results in the failure of the roof covering to perform its intended function, to keep out elements over an extended period of time”. The entire basis, for the most part, of the CHURCH MUTUAL (*i.e.* Dutton Report), hinges on a definition of functional damage that is *not pursuant* to the policy. The Dutton report, therefore, relies on a *fully incorrect definition* of functional damage. This, in and of itself, suggests that the entire Dutton report qualifies for exclusion from this case [Reference Supreme Court Case: Kumho Tire Co. vs. Carmichael, 526 U.S 137 (1999)].

**3.0.2. OPINION #2:** In the DISCUSSION section of the CHURCH MUTUAL report, pages 2, 3, and 4, the narrative concerning Galvalume®, Mr. Dutton explicitly contradicts himself which even further invalidates his ensuing arguments.

Page 4 of the Dutton report reads: “an aged hail divot and *can be used* by a trained eye to *approximate the age* of the hail event. Although this is *not an exact science*...”. Mr. Dutton opens with claim that the naked eye can approximate age but then goes on to admit this is not exact science. This is in contradiction, and the Dutton report does not contain any “exact science” or testing data whatsoever to support his claim with respect to confirming the age of a divot.



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**3.0.3. OPINION #3:** In “The Element Report” section of the CHURCH MUTUAL report, page 6, Mr. Dutton uses stereoscope images to somehow confirm age differences between divots. This is *technically incorrect* and there is no testing data to confirm the statement.

The Element report B24060512 explicitly states “This document shall not be reproduced, except in full, without the written approval of Element Materials Technology.”, yet Mr. Dutton did not receive permission to do so. He then proceeded to extract the stereoscope images from my report without permission and use these (Dutton report, page 6) to claim the age of hail divots can be verified from a set of optical pictures.

Stereoscope images cannot be used to verify the age of an indentation as it relates to the level of corrosion. Doing this *is not science*, and in fact once again, *there is no science or testing information* in the Dutton report whatsoever. Especially to support the claim that differences in divot age were confirmed. Essentially, the use of stereoscope images *only* to somehow definitively claim age between two corroded structures, is *technically incorrect*.

**3.0.4. OPINION #4:** Figures 2 and 3 in the CHURCH MUTUAL report confirm that Mr. Dutton incorrectly interpreted the SEM data in the Element Report, especially with respect to microcracking. His entire narrative is therefore full of *nonsensical claims*.

On page 8 Mr. Dutton uses the SEM image displayed below (again without permission) and adds yellow arrows to show where he made measurements of micro-crack widths. This is shown in Figure 1 below.

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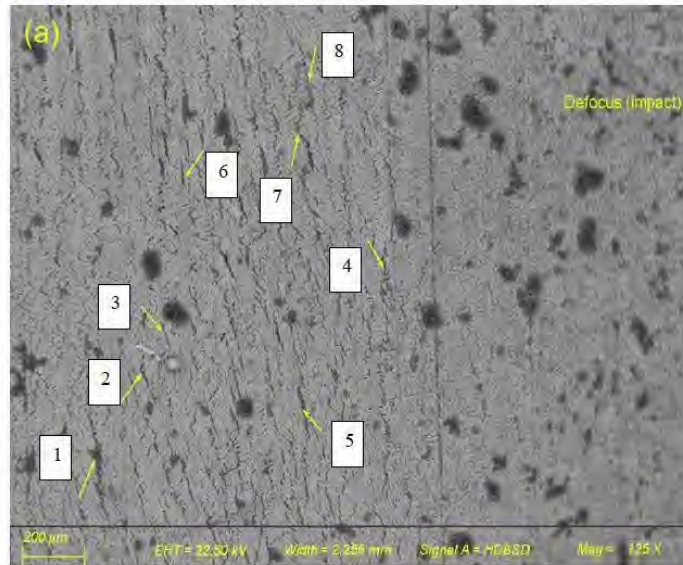


Figure 2. Figure 7a from the Element report used to measure crack widths.

**Figure 1:** SEM image shown in the Dutton report, page 8, Figure 2.

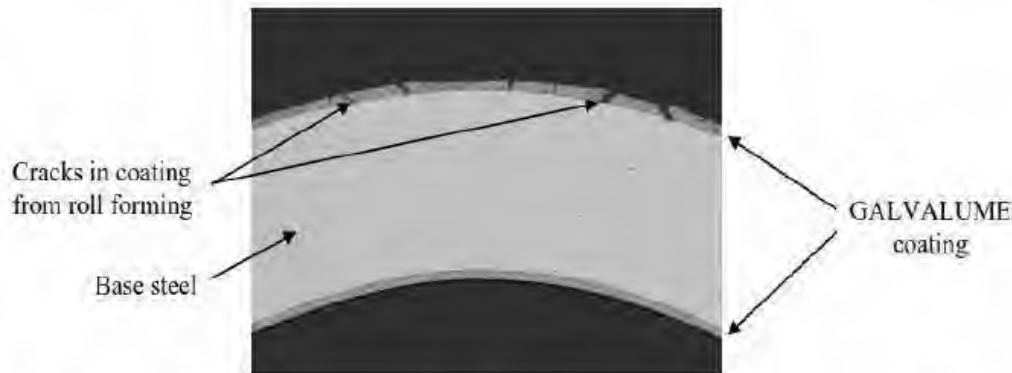


Figure 4. Metallographic cross-section of Denver profile rib radius at 75X magnification.

**Figure 2:** Optical image shown in the Dutton report, page 9, Figure 4.

Mr. Dutton then goes on to use the SEM image of the Cleburn roof micro-cracks and compare them to and optical image of the Denver roof using the information in Figure 2 below. He then claims that micro-crack widths on the Cleburne roof divots somehow confirmed age based on the micro-cracks shown in Figure 2 optically. First of all, Mr. Dutton completely missed the fact



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that microcracking at hail damage points on the Cleburne roof *was bi-axial with crisscross cracks* fully within the impact zones and *these are most consistent with point impact on the surface of a plate*. In Figure 2, Mr. Dutton then took a *uniaxial sample in bending* as a basis of comparison to the damage on the Cleburne roof. Based upon these facts, the Dutton report in essence fully misrepresented the Cleburne divot SEM image microcracks; arbitrarily took them to be uniaxial, and then compared these to a bi-axial situation to somehow say the divots are very old. The entire basis of the micro-cracking narrative in terms of divot age is therefore *fully incorrect* and essentially compares apples to oranges with zero testing data to support claims made therein. There can be zero confidence in the Dutton reports comparative analysis of any of the SEM data contained in the Element report.

**3.0.5. OPINION #5: Concluding commentary 4 of the CHURCH MUTUAL report confirms that Ron Dutton Consulting Services, LLC once again, fully misinterpreted the meaning of the information contained in the Element report.**

With respect to iron oxides, the propensity for corrosion to occur within a divot, and the corrosion of protective Zn-based coating(s), the Dutton report states: “Iron oxides in hail divots and on the undented surfaces of the Galvalume coatings are not evidence that ***the corrosion resistance of the coating*** has been compromised.” With respect to the coating material itself, which is the Galvalume® layer, the Element report ***did not claim*** in any fashion that the inherent corrosion resistance of the Zn-based coating was compromised. The Element report, instead, showed that *base metal corrosion* is accelerated at hail impact points; and, the electron microscope data confirmed elevated iron oxides were present in places where hail damage occurred. The former and latter essentially show that Dutton Consulting Services, LLC *fully misinterpreted* the meaning of the SEM data as well as the crux of the conclusions in the Element report.



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#### 4.0. Summary of Opinions.

The Dutton report is literally full of speculation, misinterpretation of SEM/EDS data, and completely nonsensical comparisons of SEM data to optical data. The Dutton report furthermore contains zero testing data to support most of their discussion(s); uses an *incorrect definition of functional damage* that is *not pursuant to the policy*, and even took images from the Element report without permission. Considering the former and latter concomitant to opinions 1 to 5 above, there can be *zero confidence in the validity or applicability* of the Dutton reports arguments as it pertains to the facts of this case. Essentially, the backbone of the Dutton report is wild speculation and compares apples to oranges with zero testing data performed to support its claims.

Report Written by  
Jeffrey Molnar

A handwritten signature in black ink, appearing to read 'Jeffrey Molnar', written over a horizontal line.